neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

50. The method of claim 32 wherein the transplanted cells have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

51. The method of claim 32 wherein the implanted colony of cells comprise cells that have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

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52. The method of claim 32 wherein the transplanted progenitor or stem cells have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

REMARKS CONCERNING THE AMENDMENTS

The above amendments have been made in an effort to more clearly define a narrower scope of the present invention. Antecedent basis for the amendments are found generally in the specification and in particular on pages 21, lines 15-26.

Clean copy of claims in accordance with 37 CFR 1.121.

1. A method for indicating viability of transplanted progenitor or stem cells grown in a culture, the method being performed with a medical device that supports at least one sensing function, the method comprising:

non-destructively observing a region of a patient to where progenitor or stem cells grown in a culture cells have been transplanted;

sensing a property within said region of a patient that is indicative of cell viability or inviability of transplanted progenitor or stem cells grown in a culture; and

using data from sensing said property within said region to indicate cell viability from a transplant of progenitor or stem cells grown in a culture within the region.

2. The method of claim 1 wherein said non-destructively observing comprises magnetic resonance imaging.

3. The method of claim 1 wherein the medical device is guided to said region of a patient using non-destructive observation.

4. The method of claim 1 wherein said medical device is positioned within said region of a patient using non-destructive observation to assist in the positioning.

5. The method of claim 1 wherein said cell viability is indicated by a property resulting from an event selected from the group consisting of cell activity, cell inactivity, cell growth, cell death, specific cell function, specific cell dysfunction, volumetric expansion of cell population, and volumetric decrease of cell population.

6. The method of claim 2 wherein said cell viability is indicated by a property resulting from an event selected from the group consisting of cell activity, cell inactivity, cell growth, cell death, specific cell function, specific cell dysfunction, volumetric expansion of cell population, and volumetric decrease of cell population.

7. The method of claim 1 wherein said property is monitored by observation of at least one parameter selected from the group consisting of local lactate levels, local glucose turnover, local phosphorous high-energy metabolite concentrations, local F-19 labeled metabolites, alterations in tissue sodium, and changes in the conversion rates of O_2 gas to H_2O water.

8. The method of claim 2 wherein said property is monitored by observation of at least one parameter selected from the group consisting of local lactate levels, local glucose turnover, local phosphorous high-energy metabolite concentrations, local F-19 labeled metabolites, alterations in tissue sodium, and changes in the conversion rates of O_2 gas to H_2O water.

9. The method of claim 6 wherein said property is monitored by observation of at least one parameter selected from the group consisting of local lactate levels, local glucose turnover, local phosphorous high-energy metabolite concentrations, local F-19 labeled metabolites, alterations in tissue sodium, and changes in the conversion rates of O_2 gas to H_2O water.

10. The method of claim 1 wherein said property is monitored by at least one technique selected from the group consisting of proton spectroscopy, monitoring of C-13 labeled glucose, monitoring by P-31 MR spectroscopy, monitoring of local F-19 labeled metabolites, monitoring of Na-23 levels, and monitoring of $17O_2$ gas conversion to H_217O water.

11. The method of claim 2 wherein said property is monitored by at least one technique selected from the group consisting of proton spectroscopy, monitoring of C-13 labeled glucose, monitoring by P-31 MR spectroscopy, monitoring of local F-19 labeled metabolites, monitoring of Na-23 levels, and monitoring of $17O_2$ gas conversion to H_217O water.

12. The method of claim 6 wherein said property is monitored by at least one technique selected from the group consisting of proton spectroscopy, monitoring of C-13 labeled glucose, monitoring by P-31 MR spectroscopy, monitoring of local F-19 labeled metabolites, monitoring of Na-23 levels, and monitoring of $17O_2$ gas conversion to H_217O water.

13. The method of claim 1 wherein said medical device includes at least one element selected from the group consisting of a volume coil surrounding the tissue and a local multi-tuned MRI RF coil.

14. The method of claim 2 wherein said medical device includes at least one element selected from the group consisting of a volume coil surrounding the tissue and a local multi-tuned MRI RF coil.

15. The method of claim 9 wherein said medical device includes at least one element selected from the group consisting of a volume coil surrounding the tissue and a local multi-tuned MRI RF coil.

16. The method of claim 12 wherein said medical device includes at least one element selected from the group consisting of a volume coil surrounding the tissue and a local multi-tuned MRI RF coil.

17. The method of claim 1 wherein said property comprises blood flow or changes in blood flow as vascular supply is developed.

18. The method of claim 2 wherein said property comprises blood flow or changes in blood flow as vascular supply is developed.

19. The method of claim 7 wherein said property comprises blood flow or changes in blood flow as vascular supply is developed.

20. The method of claim 17 wherein blood flow or changes in blood flow are measured by observation of at least one material selected from the group consisting of labeled H_2O water, contrast-agent infusion of TI-shortening agents or T2*-shortening agents, local introduction of hyperpolarized Xenon gas, or optically-active coloring agents.

21. The method of claim 18 wherein blood flow or changes in blood flow are measured by observation of at least one material selected from the group consisting of labeled H_2O water, contrast-agent infusion of TI-shortening agents or T2*-shortening agents, local introduction of hyperpolarized Xenon gas, or optically-active coloring agents.

22. The method of claim 19 wherein blood flow or changes in blood flow are measured by observation of at least one material selected from the group consisting of labeled H_2O water, contrast-agent infusion of TI-shortening agents or T2*-shortening agents, local introduction of hyperpolarized Xenon gas, or optically-active coloring agents.

23. The method of claim 2 wherein said property comprises anisotropic water diffusion.

24. The method of claim 2 wherein said property comprises the local concentrations of at least one of choline, NAA, GABA, phosphocholine, and creatine.

25. The method of claim 1 wherein the property is selected from the group consisting of a) local tissue density and cell populations, b) local electrical activity, c) local oxygenated/deoxygenated hemoglobin and changes in the local T2* reflecting the alterations in tissue oxygenation, d) changes in the vascular reserve and response to oxygenation stresses, e) tissue fluorescence and bioluminescence, f) tissue fluorescence and bioluminescence, g) electrical impedance, and h) local tissue temperature.

26. The method of claim 1 wherein the property is selected from the group consisting of a) local tissue density and cell populations, b) local electrical activity, c) local oxygenated/deoxygenated hemoglobin and changes in the local T2* reflecting the

alterations in tissue oxygenation, d) changes in the vascular reserve and response to oxygenation stresses, e) tissue fluorescence and bioluminescence, f) tissue fluorescence and bioluminescence, g) electrical impedance, and h) local tissue temperature.

27. A method for indicating viability of transplanted progenitor or stem cells grown in a culture, said method being performed with a medical device that supports at least one sensing function comprising:

non-destructively observing a region of a patient to where progenitor or stem cells grown in a culture have been transplanted;

sensing a property within said region of a patient that is indicative of cell metabolism;

repeating or continuing said sensing of a property over a period of time in which said property changes; and

using data from sensing changes in said property within said region to indicate cell viability from a transplant of progenitor or stem cells grown in a culture within the region.

28. The method of claim 27 wherein said data from sensing changes in said property indicates active metabolic function in transplanted cells.

29. The method of claim 28 wherein changes in said property are monitored by at least one technique selected from the group consisting of proton spectroscopy, monitoring of C-13 labeled glucose, monitoring by P-31 MR spectroscopy, monitoring of local F-19 labeled metabolites, monitoring of Na-23 levels, and monitoring of $17O_2$ gas conversion to H_217O water.

30. A method for indicating viability of transplanted transfected cells, the method being performed with a medical device that supports at least one sensing function, the method comprising:

non-destructively observing a region of a patient to where transfected cells have been transplanted;

sensing a property within said region of a patient that is indicative of cell viability or inviability of transplanted, transfected cells; and

using data from sensing said property within said region to indicate cell viability from a transplant transfected cells within the region.

31. The method of claim 31 wherein the transfected cells are grown in a culture prior to transplanting.

32. A method for indicating viability of transplanted, transfected cells, said method being performed with a medical device that supports at least one sensing function comprising:

non-destructively observing a region of a patient to where transfected cells grown in a culture have been transplanted;

sensing a property within said region of a patient that is indicative of cell metabolism;

repeating or continuing said sensing of a property over a period of time in which said property changes; and

using data from sensing changes in said property within said region to indicate cell viability from a transplant of transfected cells grown in a culture within the region.

33. A method for indicating viability of transplanted cells implanted into tissue, the method being performed with a medical device that supports at least one sensing function, the method comprising:

non-destructively observing a region of a patient to where cells have been implanted into tissue;

sensing a property within said region of a patient that is indicative of cell viability or inviability of cells implanted into tissue; and

using data from sensing said property within said region to indicate cell viability from within the region.

34. A method for indicating viability of an implanted colony of cells, the method being performed with a medical device that supports at least one sensing function, the method

comprising:

non-destructively observing a region of a patient to where a colony of cells have been implanted;

sensing a property within said region of a patient that is indicative of cell viability or inviability of the implanted colony of cells; and

using data from sensing said property within said region to indicate cell viability from the implanted colony of cells within the region.

35. The method of claim 34 wherein the colony of cells comprise transfected cells.

36. The method of claim 35 wherein the colony of transfected cells have been cultured prior to being implanted.

37. The method of claim 34 wherein an image from the sensing is viewed within 5 minutes of sensing.

38. The method of claim 34 wherein an image from sensing is viewed in near real time.

39. The method of claim 35 wherein an image from sensing is viewed in near real time.

40. The method of claim 36 wherein an image from sensing is viewed in near real time.

41. The method of claim 34 wherein the sensing of a property within said region of a patient that is indicative of cell viability or inviability of the implanted colony of cells is used to quantitate the cell viability.

42. The method of claim 35 wherein the sensing of a property within said region of a patient that is indicative of cell viability or inviability of the implanted colony of cells is used to quantitate the cell viability.

43. The method of claim 36 wherein the sensing of a property within said region of a patient that is indicative of cell viability or inviability of the implanted colony of cells is used to quantitate the cell viability.

47. The method of claim 37 wherein the sensing of a property within said region of a patient that is indicative of cell viability or inviability of the implanted colony of cells is used to quantitate the cell viability.

48. The method of claim 39 wherein the sensing of a property within said region of a patient that is indicative of cell viability or inviability of the implanted colony of cells is used to quantitate the cell viability.

49. The method of claim 32 wherein the transplanted, transfected cells have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

50. The method of claim 32 wherein the transplanted cells have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

51. The method of claim 32 wherein the implanted colony of cells comprise cells that have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.

52. The method of claim 32 wherein the transplanted progenitor or stem cells have been genetically engineered to express a neurotransmitter, an agonist of a neurotransmitter, a precursor of a transmitter that has neurotransmitter activity, derivative of a neurotransmitter that has neurotransmitter activity, analog of a neurotransmitter that has neurotransmitter activity, or fragment of a neurotransmitter that has neurotransmitter activity.